

**IN THE CLAIMS**

**Claims 1-11) Previously canceled.**

**12) (currently amended) A flexible superconducting core for a superconducting power cable, said core comprising:**

**a) a helical central corrugated flexible tubular element made of stainless steel;**

**b) a stainless steel core mesh positioned around [a] said helical central corrugated flexible tubular element to provide a relatively flat surface, said mesh consisting of:**

**i) a first layer of steel tape of one size; and**

**ii) a second layer of steel tape having a different [said] size from said first [layer of said steel tape] said one size of said first layer of steel tape, said second layer being positioned over said first layer;**

**c) a layer of at least one copper tape[,] positioned on top of said second layer of said [steel tape] core mesh;**

**d) a plurality of superconducting tapes layered over said at least one [said] copper tape, forming a first group of a plurality of superconducting tape layers;**

**e) a second group of a plurality of superconducting tape layers, at least one [said] layer of said second group positioned on top of said first group of plurality of superconducting tape[s] layers and being wound in one direction opposite to that of (d); and**

**wherein a pitch of [all] the layers varies from a maximum  $P_{max1}$  and  $P_{max2}$  [medium] in intermediate layers to minimum  $P_{min1}$  and  $P_{min2}$  in inner and outer layers [layers], while twist angles of the tapes in the layers vary from  $\alpha_{max1}$  [45 degrees] to  $\alpha_{min1}$  [(0**

degrees)] and from  $[\alpha_{\max 1}]$   $\alpha_{\max 2}$  to  $\alpha_{\min 2}$  [in at least one of the layers layer of tapes placed between the external surface of the core and an internal part of the layer, being the current distribution between the layers uniform and each cable layer operating at total current conductance] and at least one layer of tapes from normally conducting metal is located between the outer surface of the former and the inner surface of said layer,

wherein:

a) for the inner layers:

i)  $P_{\min 1}$  and  $\alpha_{\max 1}$  [is] are defined as minimum pitch and maximum twist angle of said tapes in the first layer made of superconducting tapes from the cable axis;

ii)  $P_{\max 1}$  and  $\alpha_{\min 1}$  [is] are defined as maximum pitch and minimum twist angle of said tapes[,] in the last [layer] layers [from the cable axis layer] made of superconducting tapes of the [part] first group of layers adjacent to the [former] central core and having one direction of lay; and

b) for the outer layers:

i)  $P_{\min 2}$  and  $\alpha_{\max 2}$  is defined as minimum pitch and maximum twist angle of tapes in the first layer made of superconducting tapes from the cable axis; and

ii)  $P_{\max 2}$  and  $\alpha_{\min 2}$  [is] are defined as maximum pitch and minimum twist angle of tapes in the [first layer] last layers [from the cable axis layer] made of superconducting tapes of the second [part] group of layers with opposite direction of lay.

13) (previously amended) The flexible superconducting core according to claim 12, wherein said flexible tubular corrugated element has an external diameter of preferably between 4 and 6 cm, an internal diameter between 2 and 4 cm, a corrugation depth ranging between 0.5 cm and 1 cm, and a corrugation pitch between 0.8 and 1.5 cm.

14) (previously amended) The flexible superconducting core for claim 12, wherein the stainless steel tape for said first layer has a width ranging between 4 cm and 5 cm and a thickness between 0.005 to 0.006 cm and spacing ranging from 0.15 to 0.2 cm and the second layer of stainless steel tape is applied which has a width ranging from 2.5 to 4 cm and a thickness ranging from 0.001 to 0.002 cm with a spacing ranging from 0.1 to 0.15 cm.

15) (currently amended) The flexible superconducting core according to claim [1] 12, wherein the [first layer of] at least one copper [tapes] tape has a width ranging from 0.25 cm to .40 cm and a thickness ranging from 0.025 to 0.030 cm with a laying length ranging from 2 to 100 cm.

16) (previously amended) The flexible superconducting core according to claim 12, wherein said core operates with a current selected from the group consisting of direct current, alternate current, current pulses and combinations thereof.

17) (currently amended) The flexible superconducting core according to claim 1, wherein said tapes of copper are made from the group consisting of metals and alloys with low electric resistance based on a metal selected from the group consisting of aluminum, copper and silver.

18) (previously canceled)

19) ( previously canceled)

20) (currently amended) The superconducting core according to claim [1] 12, wherein said superconducting [elements of the flexible conductor core to be used may] tapes can be a shape selected from the group consisting of flat, round oval and a sector.